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Appl. No. 09/266,936

Remarks

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Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 1-16 are pending in the application. Claim 17 has been cancelled without prejudice to or disclaimer of the subject matter therein. These changes are believed to introduce no new matter, and their entry is respectfully requested.

Support for adding a new last sentence to the paragraph at the top of page 8 which recites: "A second pigment or filler can also be selected from the group consisting of calcium carbonate, calcium sulphate, aluminum silicate, kaolin and aluminum hydroxide, magnesium silicate, talc, titanium dioxide, silica and barium sulphate and mixtures thereof" is found, *inter alia*, in claim 11 as filed.

Support for the amendment to claim 1 is found, *inter alia*, in claim 3 as originally filed. Support for amending claim 1 to refer to calcium oxalate instead of calcium carbonate is found, *inter alia*, at page 5 (lines 1-3).

Support for the amendment to claim 2 is found, *inter alia*, at page 5 (third full paragraph).

Support for the amendment to claim 3 is found, *inter alia*, at page 8 (line 3).

Support for the amendment to claim 4 is found, *inter alia*, at page 4 (third paragraph).

Support for the amendment to claim 5 is found, *inter alia*, at page 7 (first full paragraph).

Support for the amendment to claim 7 is found, *inter alia*, at page 6 (first full paragraph).

Support for the amendment to claims 8 and 9 is found, *inter alia*, at page 6 (third full paragraph).

Support for the amendment to claim 10 is found, *inter alia*, at page 5 (first full paragraph).

Based on the above amendment and the following remarks, Applicant(s) respectfully request(s) that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

Description of the Invention

The present invention is based on the surprising findings that calcium oxalate has a number of valuable properties when used as a filler or pigment. All or a part of the traditional fillers and pigments needed for achieving a high degree of brightness and opacity can be replaced by calcium oxalate. Not only has it been discovered that calcium oxalate will give excellent optical properties but it has also been discovered that calcium oxalate also significantly reduces the combustion residue of the paper as recited in claim 1. Another valuable property of calcium oxalate is that it has a very small wearability (Table 2). Thus, papers containing calcium oxalate pigments will reduce the wear of the wire used in making the paper, compared to papers containing conventional pigments, such as calcium carbonate.

Objection to the Specification

The objections to the specification, for lack of appropriate headings, description for the drawings and for reference to claims, is noted. The amendments to the specification correct the deficiencies cited. Reconsideration and withdrawal of the objection to the specification is respectfully requested.

Objection to the Claims

Claims 5-11, 16 and 17 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from another multiple dependent claim. The claims have been amended to correct the deficiency cited. Reconsideration and withdrawal of the objection to the claims is respectfully requested.

Rejections under 35 U.S.C. § 112

Claims 1-12, 16 and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite. Applicant respectfully traverses this rejection.

Claims 1-11 are rejected because it is unclear what is meant by "reducing the combustion residue" of a coated paper. Applicant respectfully traverses the rejection.

The term "combustion residue" is a term of art. The combustion residue is the residue left after complete combustion of the paper at high temperature. It is also called the "ash

content.” In that regard, the examiner is respectfully directed to **Exhibit 1** from the “Paper Dictionary” at <http://www.paperonweb.com/dict11.htm>].

The specification, at page 5, lines 5-14, discloses that calcium oxalate reduces the combustion residue since evaporating water and released carbon dioxide are not part of the combustion residue. Example 4, at page 14, provides an example whereby the combustion residues of 3 papers of differing composition is determined. From the non-limiting examples provided in the specification, one of ordinary skill in the art would clearly recognize a reduction in combustion residue. As such, the claim is not indefinite.

Reconsideration and withdrawal of the rejection is respectfully requested.

Claim 5 is rejected because the term "wood-free" is indefinite. Applicant respectfully traverses the rejection.

The examiner indicates that support in the specification would overcome this rejection. The examiner's attention is directed to page 7, lines 7-14, which defines cellulosic material as being derived from lignocellulosic raw material such as wood and that said material can be wood-containing or “wood-free” (LWC, SC, coated printing paper and fine papers). This portion of the specification should provide ample support for the term "wood-free".

The term “wood-free” has an acceptable art meaning. In that regard, the Examiner's attention is respectfully directed to **Exhibit 1**, wherein the definition of “wood-free” is given as “pulp furnish without mechanical pulp.” The Examiner's attention is also respectfully directed to **Exhibit 2**, pages 634 and 636 from “Paper and board Dictionary,” Laurila, J. and Hattari, A., eds., The Finnish Paper and Timber Journal, Publishing Company, 2nd edition, 1996, on which there are mentioned a number of “wood-containing” or “wood-free” items.

In **Exhibit 1**, Pulp is defined as a "suspension of cellulose fibers in water" and "furnish" is defined as a blend of fibers, pigments, dyes, fillers and other materials that are fed to the wet end of the paper machine.

Accordingly, the claims are not indefinite. Reconsideration and withdrawal of the rejection is respectfully requested.

Claim 6 is rejected because the term "wood-containing" is unclear. Applicant respectfully disagrees. "Wood-containing" is the opposite of "wood-free," i.e., wood furnish with mechanical pulp. Accordingly, the claim was not indefinite.

Reconsideration and withdrawal of the rejection is respectfully requested.

Claims 7 and 16 are rejected because it is unclear what physical property the percentage [of calcium oxalate] is based on and what the dry matter comprises. Applicant respectfully traverses the rejection.

The claims have been amended to specify that the percent of calcium oxalate is determined by weight and the dry matter is from the total weight of the fine paper. Support for the amendment can be found, for example, in Example 4 at page 14 of the specification.

Reconsideration and withdrawal of the rejection is respectfully requested.

Claim 8 is rejected because the term "narrow particle size distribution" is a relative term. Applicant respectfully traverses the rejection.

Claim 8 has been amended to recite that over 90% of the ground calcium oxalate particles used are smaller than 2.3 μm . The claim, as amended, is definite.

Reconsideration and withdrawal of the rejection is respectfully requested.

Claim 9 is rejected because the term "suitable" within the phrase "suitable particle size" is indefinite. Applicant respectfully traverses the rejection.

Claim 9 has been amended to indicate that the calcium oxalate is milled to a particle size suitable to produce a paper having an ISO brightness of over 80% and an opacity of over 80%. The claim, as amended, is definite.

Reconsideration and withdrawal of the rejection is respectfully requested.

Claim 11 is rejected because the Markush group listing is unclear. The claim has been amended to clarify the species and mixture of species.

Reconsideration and withdrawal of the rejection is respectfully requested.

Claim 12 is rejected for being indefinite with regard to the physical property upon which the percentage is based. Claim 12 has been amended to further clarify the matter.

Reconsideration and withdrawal of the rejection is respectfully requested.

Claim 17 is rejected for being indefinite because the term "essentially" is unclear. Applicant respectfully traverses the rejection.

The specification, at page 6, lines 1-8, discloses when a paper is deemed to be essentially incombustible (see in particular lines 6-7).

Reconsideration and withdrawal of the rejection is respectfully requested.

Claims 3, 4 and 13 are rejected under 35 U.S.C. 112, first paragraph, for lack of enablement because there is not an explanation for how ISO brightness and opacity are determined. Applicant respectfully traverses the rejection.

Claim 1 now reflects the subject matter of original claim 3. The claims are directed to a method of reducing the combustion residue of fine papers and to a coated, fine paper. The claims are not directed to a method for determining ISO brightness and opacity and therefore such method steps are not part of the claims. Further, the specification, at page 10, lines 4-8, refer to the SCAN standards as the method of testing. SCAN standards are well known in the art and are tests that are available commercially (see **Exhibit 3: SCAN test methods** from the web site at the url: <http://www.stfi.se/documents/contract/services/standard/methods.htm>). The SCAN 8:93 and SCAN-P 3:93 referred to in the specification were well known at the time of Applicant's priority date. Therefore, the specification clearly enables one skilled in the art to determined these physical characteristics.

Reconsideration and withdrawal of the rejection is respectfully requested.

Claim 14 is rejected under 35 U.S.C. 112, first paragraph, for lack of enablement because the method by which "maximum combustion residue" is determined is unexplained. The examiner also states that it is "unclear whether dry matter comprises just the base paper, the base paper and coating, just the coating, etc." Applicant respectfully traverses the rejection.

Example 4, at page 14, provides an example whereby the combustion residues of 3 papers of differing composition is determined. It does not matter if the papers are coated or if the kaolin/calcium carbonate/calcium oxalate is incorporated into the paper. It is the % of the total weight that matters for combustion purposes and that is given in the example. From the

non-limiting examples provided in the specification, one skilled in the art would clearly recognize how to determine a "maximum combustion residue" of 33%. As such, the claim is enabled.

Reconsideration and withdrawal of the rejection is respectfully requested.

The indefiniteness of the claim language seems more appropriate under 35 U.S.C. 112, second paragraph. It is assumed this was the intent of the examiner. The claim has been amended to recite that the percentage is determined from the total weight of the dry matter. Support for the amendment can be found, for example, at page 14. Methods of combusting paper so as to determine the combustion residue are well known in the paper-making art.

Reconsideration and withdrawal of the rejection is respectfully requested.

Rejection under 35 U.S.C. § 102

Claims 1 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by SE8904337A (Carno). Carno is alleged to teach the addition of calcium oxalate to the pulp grist or applied as a coating to paper as part of a pigment. Applicant respectfully traverses the rejection.

A translation of Carno is provided in the accompanying IDS. In Carno, calcium oxalate is employed for reducing light induced yellowing of wood-containing papers. Typically, such papers, e.g. newsprint, are prepared from high-yield pulps having low brightness and opacity. Thus, Carno described the treatment of CTMP pulp (yield 90%) with calcium chlorate and oxalic acid at pH 1.5. Calcium oxalate will precipitate within the pulp and on the fibres. According to Carno, after 2 hours of radiation, the brightness has dropped from the initial value of 68 to 66 for the treated samples, whereas the brightness of the

untreated has dropped to 56. By contrast, according to the amended claim 1, at least a part of the conventional pigments needed for achieving a brightness of at least 80 are replaced with calcium oxalate. This will make it possible to reduce the combustion residue.

There is no indication of the optical properties of calcium oxalate in fine papers in the cited art. Likewise, the cited art is silent about the possibility of reducing wear of a paper or cardboard making wire by the incorporation of calcium oxalate in the fine papers (claim 12).

In view of the above, favorable consideration of the amended claims is respectfully submitted.

Rejection under 35 U.S.C. § 103

Claims 1-4, 13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda et al. (U.S. Pat. No. 5,925,446) in view of SE8904337A (Carno). Matsuda et al. is alleged to teach a paper and a method of making a paper wherein the paper comprises a base paper and a coating. The base paper allegedly comprises pulp and filler and cellulose and mechanical pulps may allegedly be used. The coating allegedly comprises a binder and a pigment. The paper allegedly has an opacity of at least 90% and a brightness of at least 82%. Matsuda et al. do not teach the addition of calcium oxalate to the pulp and/or coating of the paper. Carno allegedly teaches the addition of calcium oxalate to the pulp grist or applied as a coting [sic] to paper as part of a pigment. "[t]he examiner takes the position that it would have been obvious to one of ordinary skill in the art to replace some of the filler/pigment taught in Matsuda with calcium oxalate in order to prevent light induced yellowing of the paper pulp." The examiner notes "that a difference in concentrations or temperatures will not support the patentability of subject matter encompassed by the prior art unless there is

evidence indicating such concentration or temperature is critical. "[t]he examiner takes the position that it would have been obvious to one of ordinary skill in the art to add calcium oxalate to the paper and/or paper coating in sufficient amounts in order to maximizing the paper's protection against yellowing". The examiner further notes that calcium oxalate are known to render papers fire resistant. Applicant respectfully traverses the rejection.

Prima facie obviousness is not established. The claims are directed to a method for reducing the combustion residue of fine papers (claims 1-4), a coated fine paper with an ISO brightness over 80% and an opacity over 80% that contains calcium oxalate as a filler or pigment (claim 13) and a fine paper, with the limitations of claim 13, wherein the total content of calcium oxalate is over 85% (claim 15). The examiner has stated it would have been obvious to one of ordinary skill in the art to add calcium oxalate to the paper and/or paper coating to maximize the paper's protection against yellowing. Therefore, the motivation from the art is to prevent the yellowing of paper and not to reduce the combustion residue of the paper. MPEP 2142 states, in part:

"The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. If the examiner does not produce a *prima facie* case, the applicant is under no obligation to submit evidence of nonobviousness...In view of all factual information, the examiner must then make a determination whether the claimed invention "as a whole" would have been obvious at that time to that person...impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art...To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings...the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. In re Vaack, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)..."To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985)...When the motivation to combine the teachings of the references is not immediately apparent, it is the duty of the examiner to explain why the combination of the teachings is proper. Ex parte Skinner, 2 USPQ2d 1788 (Bd. Pat. App. & Inter. 1986)." [emphasis added].



The examiner has not shown a suggestion or motivation in the combination of cited art to reach the invention, a method to reduce the combustion residue of fine paper with the claimed physical properties (claims 1-4), a coated fine paper with an ISO brightness over 80% and an opacity over 80% that contains calcium oxalate as a filler or pigment (claim 13) and a fine paper, retaining the limitations of claim 13, wherein the total content of calcium oxalate is over 85% (claim 15). Motivation to combine the teachings of Matsuda et al. and Carno to arrive at the present invention, with the recited limitations, is absent from the art. Thus, there is not a *prima facie* case of obviousness for claims 1-4, 13 and 15. Further, the deficiencies in the Carno reference have been noted above. The teachings of Carno would not result in the claimed subject matter.

In view of the above, favorable consideration of the amended claims is respectfully submitted.

Foreign Priority Document

A certified copy of the foreign priority document, and a claim to priority thereto, is provided herewith.

Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicant(s) therefore respectfully request(s) that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicant(s) believe that a full and complete reply has been made to the

outstanding Office Action and, as such, the present application is in condition for allowance.

If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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Version with markings to show changes made

In the Specification

Page 1, second paragraph, was rewritten as follows:

The invention also concerns a web of coated fibrous material [according to the preamble of claim 13].

Page 2, next to last paragraph, was rewritten as follows:

More specifically, the method of reducing the combustion residue of coated paper and cardboard exhibiting a predetermined brightness and opacity according to the present invention is characterized by [what is stated in the characterizing part of claim 1] replacing at least a part of the amount of conventional filler and/or coating pigment necessary for reaching the predetermined brightness and opacity with calcium carbonate.

Page 2, last paragraph, was rewritten as follows:

The material web according to the invention is characterized [by what is stated in the characterizing part of claim 13] wherein the coated fine paper has an ISO brightness of over 80% and an opacity of over 80% and wherein the coated fine paper contains as a filler and/or pigment calcium oxalate optionally together with fillers and coating pigments, respectively.

Page 3, paragraph 3, was written as follows:

[In the attached drawings,] Figure 1 is an electron microscope image of calcium oxalate crystals. [and] Figure 2 shows the particle size distribution of milled calcium oxalate.

Page 4, paragraph 3, was rewritten as follows:

By using calcium oxalate as a pigment or filler it is possible to produce papers and cardboard having high opacity and/or brightness. In particular, by using calcium oxalate as the sole pigment and/or filler or as a part of the pigment/filler residue of papers or cardboards it is possible to obtain products having an ISO brightness [brighthness] of 80 % or more, preferably 90 % or more. The opacity of the products can be increased to 80 % or more, preferably 90 % or more by using calcium oxalate as a filler/pigment.

Page 5, 3rd full paragraph, was rewritten as follows:

Although the paper or cardboard material produced by the present invention is not easily (or spontaneously) ignited, it can still be discarded and destroyed [distroyed] by burning (combusting) it together with other flammable components, such as other paper and cardboard products or polymers etc. The present invention therefore provides for an advantageous method of discarding paper and cardboard products by combustion. The method comprises collecting used paper and/or cardboard products having a calcium oxalate content of at least 10 % of the dry matter and preferably of at least 50 % of the total pigment/filler content of the products, combusting the paper and/or cardboard products, recovering the heat generated during combustion, and collecting and discarding the ash.

Page 6, the 4th full paragraph, was rewritten as follows:

Figure 1 shows an electron [electrone] microscope picture of milled calcium oxalated crystals. The Figure also shows that the crystals are very much of equal size and about spherical.

Page 7, last paragraph, (continuing onto page 8) was written as follows:

Calcium oxalate can be formulated into suitable coating colours. In the present invention "coating colour" means a composition designed for the coating or surfacing of paper or board, containing water and components known per se, such as pigments, binding agent and a component regulating the viscosity (a thickening agent). In addition to calcium oxalate, the following pigments can be used: calcium carbonate, calcium sulphate, [aluminium] aluminum silicate, kaolin ([aluminium] aluminum silicate containing [crystallization] crystallization water), [aluminium] aluminum hydroxide, magnesium silicate, talc (magnesium silicate containing [crystallization] crystallization water), titanium oxide and barium sulphate and mixtures of these. Also synthetic pigments may be employed. Primary pigments of those mentioned above are calcium oxalate, kaolin and/or calcium carbonate, usually amounting to over 50 % of the dry matter of the coating composition. Calcinated kaolin, titanium oxide, precipitated carbonate, satin white, [aluminium] aluminum hydroxide, sodium silica aluminate and plastic pigments are additional pigments and the amounts of these are usually below 25 % of the dry matter content of the mixture. Special pigments to be mentioned are special kaolins and calcium carbonates and barium sulphate and zinc oxide. A second pigment or filler can also be selected from the group consisting of calcium carbonate, calcium sulphate, aluminum silicate, kaolin and aluminum hydroxide, magnesium silicate, talc, titanium dioxide, silica and barium sulphate and mixtures thereof.

Page 10, second paragraph, was rewritten as follows:

The following non-limiting examples illustrate the [inveniton] invention. The light scattering coefficients, light absorption coefficients and opacities have been determined by the standard SCAN 8:93. ISO brightness (R457) has been determined according to standard SCAN-P 3:93. The grammage of the sheets and their thicknesses are determined according to standards SCAN-P 6:75 and SCAN-P 7:75, respectively.

Page 11, the header of example 3, beginning at line 26, was rewritten as follows:

Example 3 [Esimerkki]

Determination of the optical properties of coating layers and of coated paper

In the Claims

Claim 1 (Once Amended). A [Method] method of reducing the combustion residue of [coated paper or cardboard] fine papers having an ISO brightness of 80% or more and an opacity of 80% or more [a predetermined brightness and opacity], wherein said method comprises making said paper with a [characterized by replacing at least a part of the amount of conventional] filler and/or coating pigment that comprises [necessary for reaching the predetermined brightness and opacity with] calcium oxalate [carbonate].

Claim 2 (Once Amended). The method according to claim 1, wherein the proportion of calcium oxalate present in the entire amount of pigment and filler is between [amounts to] 10 and [to] 100% of the total pigment and filler.

Claim 3 (Once Amended). The method according to [claim 1 or] claim 2, wherein said calcium carbonate is in said pigment [a coated paper is manufactured having an ISO brightness of over 80 % and an opacity of over 80 %].

Claim 4 (Once Amended). The method according to claim [3] 1, wherein [a coated paper is manufactured having] said [an] ISO brightness is [of] over 90% and said [an] opacity is [of] over 90%.

Claim 5 (Once Amended). The method according to any one of [the preceding claims] claims 1 - 4, wherein said fine paper is a wood-free fine paper [is produced].

Claim 7 (Once Amended). The method according to any one of [the preceding] claims 1-4, wherein the amount of calcium oxalate is 0.1 to 90% by weight, calculated from the total weight of the dry matter of the fine paper [or cardboard].

Claim 8 (Once Amended). The method according to any one of [the preceding] claims 1-4, wherein said calcium oxalate has been ground and [having a narrow particle size distribution is used] over 90% of the particles of said ground calcium oxalate that are used are smaller than 2.3 μm and only 10% are smaller than 0.5 μm .

Claim 9 (Once Amended). The method according to claim 5 [8], wherein [the] said calcium oxalate has been ground and over 90% of the particles of said ground calcium oxalate that are used are smaller than 2.3 μm and only 10% are smaller than 0.5 μm [milled to suitable particle size].

Claim 10 (Once Amended). The method according to any one of [the preceding] claims 1-4 [1-9], wherein said calcium oxalate is calcium oxalate monohydrate [is used].

Claim 11 (Once Amended). The method according to any one of [the preceding] claims 1-4 [1-9], said method further comprising using a second pigment or filler selected from the group consisting of calcium carbonate, calcium sulphate, [aluminium] aluminum silicate, kaolin, [and aluminium] aluminum hydroxide, magnesium silicate, talc, titanium dioxide, silica, [and] barium sulphate and [mixtures] combinations thereof.

Claim 12 (Once Amended). A method [Method] of reducing the wear of [a paper or cardboard] a fine paper-making wire wherein said method comprises [characterized by] incorporating calcium oxalate into [a paper or cardboard web] said fine paper or into the coating [colour] color used for coating [of the web] said fine paper [instead of conventional pigments so that] wherein said [the portion of] calcium oxalate [of the total amount of pigments is] comprises 10 to 100% of the total pigment.

Claim 13 (Once Amended). Coated[, fibrous material web] fine paper, [characterized in that] wherein said fine paper:

- [it] has an ISO brightness of over 80% and an opacity of over 80% and
- [it] contains calcium oxalate as a filler and/or pigment [calcium oxalate optionally together with fillers and coating pigments, respectively].

Claim 14 (Once Amended). The [material web] fine paper according to claim 13, wherein said fine paper [it] has a maximum combustion residue of 35 %, calculated from the total weight of the dry matter of the [material] fine paper.

Claim 15 (Once Amended). The fine paper of claim 13, wherein said fine paper further comprises fillers and/or coating pigments other than calcium oxalate [material web according to claim 13 or 14, wherein it is manufacture from cellulosic pulp or mechanical pulp].

Claim 16 (Once Amended). The [material web] fine paper according to any of claims 13 to 15, wherein the total content of said calcium oxalate is over 85% of the total weight of the dry matter of said fine [the] paper.

Claim 17 was canceled.